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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/577,529	05/24/2000	Timothy A. Fischer	10141US01	4671

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STEVEN J SHUMAKER
SHUMAKER & SIEFFERT PA
8425 SEASONS PARKWAY
SUITE 105
ST PAUL, MN 55125

EXAMINER	
NGUYEN, MADELEINE ANH VINH	
ART UNIT	**PAPER NUMBER**
2626	

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/577,529	FISCHER ET AL.	
	Examiner	Art Unit	
	Madeleine AV Nguyen	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *RCE filed on January 27, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-56 and 59-68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11-17,19-28,30-35,37-46,48-54,56 and 59-67* is/are rejected.

7)☒ Claim(s) *10,18,29,36,47,55 and 68* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 27, 2005 has been entered.

Applicant cancels claims 57-58, amends claims 1, 3-9-13, 15-20, 22-31,33-38, 40-50, 52-56, 59-68.

Response to Arguments

2. Applicant's arguments filed on January 27, 2005 have been fully considered but they are not persuasive.

Stokes provides no teaching that would have suggested constraining destination device-dependent coordinates produces by a multi-dimensional color transformation to prevent removal or introduction of selected colorants specified by source device-dependent coordinates as required in the amended claims.

It is noted that, in addition to the remarks previously mentioned, although Stokes does not directly teach the constraining destination device-dependent coordinates as amended, Stokes teaches "the present invention is applicable to color mapping between any arbitrary pair of a source device and a destination device." (col. 4, lines 40-41) wherein "mapping from the source color space to the destination's color space involves the steps of measuring colors available to the destination device, building a three-dimensional lookup table relating source device colors

and destination device colors, and using the lookup table to converting a specified color from the source color space to the destination color space." (col. 5, lines 5-12). Stokes further teaches that "in order to accurately characterize the color gamut of the destination device, colors produced by the destination device are measured in a device-independent color space such as L*a*b*." (col. 5, lines 17-20) and "the result is a large number of color specification pairs (L*a*b*, CMYK)." (col. 5, lines 30-31). Thus, colors in the input dependent source color space (such as RGB) are converted to colors in the independent color space L*a*b* and the colors in the output dependent destination color space (such as YMCK) are converted to colors in the independent color space L*a*b* for matching. "Whether or not the color is reproducible by the destination device is judged in accordance with distances in the device-independent color space between the source device color and the closest measured destination device colors." (col. 5, lines 40-43). Stokes further teaches that "if the color name associated with the out-of gamut color and the color name associated with the different in-gamut color are different, the out-of gamut color is remapped to a still different in-gamut color within the color gamut of the destination device. This step is repeated until the color name associated with the out-of-gamut color and the color name associated with the different in-gamut color are the same." (col. 3, line 62 – col. 4, line 2). Thus, although Stokes uses the colors in the independent color space of the source and destination to match based on predefined constraints, it would have been obvious to one skilled in the art at the time the invention was made to consider Stokes teaches the step of or means for constraining the destination device dependent coordinates (based on the color pairs (L*a*b*, destination color space) produced by the multidimensional color transformation to prevent removal or introduction

of selected colorants specified by the source device-dependent coordinates (RGB) since the color names are the same.

In addition, Stokes' teaching can read in Fig.2 of the specification. For instance, the processor 12 applies a forward model 22 to convert the source device coordinates 20 to device independent space L*a*b* coordinates and a forward model 26 to convert the destination device coordinates 24 to device independent space L*a*b* coordinates (Stokes: col. 4, line 25 – col. 5, line 32). A search module 28 executed by processor 12 governs the search for matching coordinates to seek destination device coordinates that minimize the calculated error in error calculation 30 (Stokes: judging between the distances in the device-independent color space between the source device color and the closest measured destination device colors by comparing some threshold values col. 5, lines 35-64) based on constraints input to constraints 32 (Stokes: desired constraints: Abstract; col. 8, lines 38-40). Thus, in Fig.2, the present invention also uses source device coordinates in independent color space L*a*b* as in Stokes to constrain the destination device-dependent coordinates in order to prevent removal of selected colorants specified by the source device-dependent coordinates.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-9, 11-17, 19-28, 30-35, 37-46, 48-54, 56, 59-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stokes (US Patent No. 5,611,030).

Concerning claims 1, 6, 13, 15, Stokes discloses a method for multi-dimensional color transformation (Fig.3) comprising the steps of applying a multi-dimensional color transformation for transformation of a source device dependent coordinates (input device coordinates) to a destination dependent coordinates (output device coordinates), (col. 4, lines 25-44); and constraining the destination device coordinates produced by the multi-dimensional color transformation for having a same color with the source device coordinates; (Abstract; col. 3, line 37 – col. 4, line 2; col. 4, line 63 – col. 7, line 67; col. 8, lines 7-43).

Stokes does not directly teach that the constraining steps are to prevent removal of selected color image data present in the source image and to prevent introduction of selected color image data not present in the source image. However, Stokes teaches the mapping routine whereby an out-of gamut color A (selected color image data present in the source image) is mapped to an in-gamut color A' (selected color image data present in the destination image). If the color names of A and A' match (the selected color image data present in the source image is not removed), the result of the mapping are stored in the color lookup table. If the color names A and A' do not match (the introduction of selected color image data A' not present in the source image), the mapping is modified. In other words, for the color gamut mapping arrangement, when an out-of gamut color within one color name boundary is mapped to an in-gamut color within a different color name boundary, a color name boundary violation is occurred and the mapping is modified to prevent the violation. A first mapping constrain for determining whether the color names A and A' are the same name is equivalent to the step of constraining the multi-

dimensional color transformation to prevent removal of selected color image data present in the source image since there is no removal of selected color image data present in the source image. A second mapping constrain for modifying the mapping routine when the color names of A and A' are different is equivalent to the step of constraining the multi-dimensional color transformation to prevent introduction of selected color image data not present in the source image since the modified mapping is for reaching a destination color name A' having the same source color name A to prevent the adding of a selected color image not present in the source image (Figs.2-3; col. 3, line 49 – col. 4, line 2; col. 4, line 63 – col. 5, line 12; col. 5, line 51 – col. 8, line 17). It is noted, In Stokes, the source device coordinates are the source device independent color space coordinates of L*a*b* and the destination device coordinates are the destination device independent color space coordinates L*a*b*, the multi-dimensional color transformation is the 3-D color transformation, the specified color image is the color image of the original image prepared by or for the source device. Although Stokes does not directly teach the prevention of the removal of selected color image data specified by source device coordinates or the prevention of the introduction of specified color image data not specified by source device coordinates, Stokes teaches in Fig.3 the manner in which colors are prevented from crossing color name boundaries during gamut mapping (col. 4, lines 15-17). First, the color name of an out-of gamut color A to be mapped is checked. Next, it is determined whether the out-of-gamut color A is mapped to an in-gamut color A'. If the color names of A and A' match, then the results of the mapping are stored in the color lookup table of Fig.1. If the color names of A and A' do not match, the mapping is modified until the color names of A and A' match. That can be interpreted that, in case the selected color A of the source device is not the same with the

transformed color A' of the destination device, the mapping is modified to prevent the removal of the specified color A since the transformed destination color A' is different with the selected color A. In a different way of interpretation, in case the selected color A of the source device is not the same with the transformed color A' of the destination device, the mapping is modified to prevent the introduction of a new color image A' that is different from the specified color A. It would have been obvious to one skilled in the art at the time the invention was made to consider the modification of the mapping in Stokes so that selected colors of the source device and the destination device are the same equivalent to the prevention of a removal of selected color image data specified by the source device coordinates and the prevention of the introduction of selected color image data not specified by source device coordinates since in these three cases, there is no removal of any color and no introduction of any color.

Stokes does not directly teach the constraining destination device-dependent coordinates. However, Stokes teaches "the present invention is applicable to color mapping between any arbitrary pair of a source device and a destination device." (col. 4, lines 40-41) wherein "mapping from the source color space to the destination's color space involves the steps of measuring colors available to the destination device, building a three-dimensional lookup table relating source device colors and destination device colors, and using the lookup table to converting a specified color from the source color space to the destination color space." (col. 5, lines 5-12). Stokes further teaches that "in order to accurately characterize the color gamut of the destination device, colors produced by the destination device are measured in a device-independent color space such as L*a*b*." (col. 5, lines 17-20) and "the result is a large number of color specification pairs (L*a*b*, CMYK)." (col. 5, lines 30-31). Thus, colors in the input

dependent source color space (such as RGB) are converted to colors in the independent color space L*a*b* and the colors in the output dependent destination color space (such as YMCK) are converted to colors in the independent color space L*a*b* for matching. "Whether or not the color is reproducible by the destination device is judged in accordance with distances in the device-independent color space between the source device color and the closest measured destination device colors." (col. 5, lines 40-43). Stokes further teaches that "if the color name associated with the out-of gamut color and the color name associated with the different in-gamut color are different, the out-of gamut color is remapped to a still different in-gamut color within the color gamut of the destination device. This step is repeated until the color name associated with the out-of-gamut color and the color name associated with the different in-gamut color are the same." (col. 3, line 62 – col. 4, line 2). Thus, although Stokes uses the colors in the independent color space of the source and destination to match based on predefined constraints, it would have been obvious to one skilled in the art at the time the invention was made to consider Stokes teaches the step of or means for constraining the destination device dependent coordinates (based on the color pairs (L*a*b*, destination color space) produced by the multidimensional color transformation to prevent removal or introduction of selected colorants specified by the source device-dependent coordinates (RGB) since the color names are the same while each source or destination device coordinate has an equivalent of L*a*b* value.

Concerning claims 2-5, 7-9, 11-12, 14, 16, 17 Stokes further teaches that the multi-dimensional color transformation is configured based on the constraints imposed in step (b) (whether the mapping to in-gamut color process has the same name in case of out-of gamut), (claim 2), (col. 3, lines 37-42; col. 8, lines 38-43); the steps of constraining the destination device

coordinates is to prevent removal of selected colorants present at corresponding dots in the source image, or to prevent removal of black colorant present at corresponding dots in the source image, or to prevent the removal of one or more chromatic colorants present at corresponding dots in the source image (claims 3-5), (col. 4, line 62 – col. 5, line 31; col. 6, line 50 – col. 7, line 63 – col. 8, line 37); the steps of constraining the destination device coordinates is to prevent addition of selected colorants present at corresponding dots in the source image, or to prevent addition of black colorant present at corresponding dots in the source image, or to prevent addition of one or more chromatic colorants present at corresponding dots in the source image (claims 7-9, 16, 17), (col. 4, line 62 – col. 5, line 31; col. 6, line 50 – col. 7, line 63 – col. 8, line 37); the constraining steps are based at least in part on constraints specified by a user (Abstract; col. 3, lines 57-61; col. 4, lines 25-31); the source and destination images is defined by cyan, magenta, yellow and black colorants (col. 4, lines 25-44).

Concerning claims 20, 25, 31, 33, Stokes discloses a system (col. 3, lines 37-42; col. 4, lines 25-35) for multi-dimensional color transformation comprising a processor that generates a multi-dimensional color transformation for transformation of source coordinates to destination device coordinates; and a memory (for storing programs) that stores constraints; wherein the processor is programmed to apply the constraints to constrain the multi-dimensional color transform as discussed in claims 1 and 6 above.

Concerning claims 21, 22-24, 26-28, 30, 32, 34-35, 37, Stokes further teaches that the multi-dimensional color transformation is configured based on the constraints applied by the processor; the processor constrains the multi-dimensional color transform to prevent removal of selected colorants present at corresponding dots in the source image, or to prevent removal of

black colorant present at corresponding dots in the source image, or to prevent the removal of one or more chromatic colorants present at corresponding dots in the source image (claims 22-24,); the steps of constraining is to prevent addition of selected colorants present at corresponding dots in the source image, or to prevent addition of black colorant present at corresponding dots in the source image, or to prevent addition of one or more chromatic colorants present at corresponding dots in the source image (claims 26-28, 34-35); the constraining steps are based at least in part on constraints specified by a user (Abstract; col. 3, lines 57-61; col. 4, lines 25-31); the source and destination images is defined by cyan, magenta, yellow and black colorants (claim 37), (col. 5, lines 16-57).

Concerning claims 38-46, 48-49, 50-54, 56, Stokes discloses a computer-readable medium (col. 3, lines 37-42; col. 4, lines 25-35) containing program code that when executed by a processor comprises the steps as discussed in claims 1-9, 11-12 above.

Concerning claim 59, Stokes discloses a method for multi-dimensional color transformation comprising the steps of applying a multi-dimensional color transformation for transformation of source device coordinates to destination device coordinates; and constraining the destination device coordinates to matching device coordinates searched by the multi-dimensional color transformation.

Stokes does not directly teach a range of matching device coordinates as a function of the source device. However, Stokes teaches that "if the distance from the source color to the closest destination color is less than or equal to some threshold value, then the destination color is considered to be an exact match of the source color and an equivalent representation (RGB) of the destination device specification (CMYK) of the destination color is entered in the lookup

table. If the distance from the source color to the closest destination color is greater than the threshold value, then the match is considered not exact..." (col. 5, lines 51-64; col. 8, lines 15-37). It would have been obvious to one skilled in the art at the time the invention was made to consider the threshold value as a range of matching device coordinates and the distance from the source color to the closest destination color is a function of the source device coordinates since they are for matching source device coordinates with the destination device coordinates as claimed.

Concerning claims 60-67, Stokes teaches the step of constraining the destination device coordinates produced by the multi-dimensional color transformation for having a same color (including black color) at corresponding dots specified by the source device coordinates (Fig.3; col. 4, lines 62 – col. 5, line 4; col. 6, lines 58-65; col. 8, lines 7-37).

Stokes does not directly teach that the constraining steps are to prevent removal of selected color image data present in the source image and to prevent introduction of selected color image data not present in the source image. The same discussion is repeated as in claim 1 above.

Allowable Subject Matter

5. Claims 10, 18, 29, 36, 47, 55, 68 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: Claims 10, 18, 29, 36, 47, 55, 68 are allowable over the prior art of record because the Examiner

found neither prior art cited in its entirety, nor based on the prior art, found any motivation to combine any of the said prior art which teaches a system and method for multi-dimensional color transformation comprising means for or step of constraining the destination device coordinates produced by the multi-dimensional color transformation to prevent removal of selected color image data specified by the source device coordinates or to prevent the introduction of selected color image data not specified by the source device coordinates which is the addition of chromatic colorants for black-only dots specified by the source device coordinates.

Conclusion

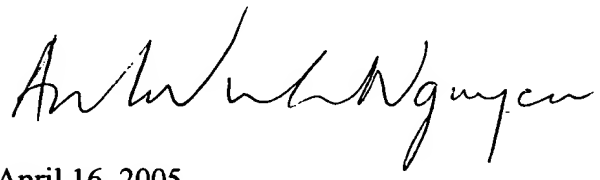
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Edge et al (US Patent No. 6,362,808) teaches an arrangement for mapping colors between imaging systems and method.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Madeleine AV Nguyen whose telephone number is 571 272-7466. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly A Williams can be reached on 571 272-7471. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Madeleine AV Nguyen
Primary Examiner
Art Unit 2626

April 16, 2005